

SMART CYLINDER THERM System



1 Application

SMART CYLINDER THERM is a modular heating system, which consists of an explosion proof electrical heater and a microprocessor which manages the set point while making sure that the CYLINDER THERM heater doesn't over heat.

The SMART CYLINDER THERM System is especially designed to heat stainless steel bottles and their contents, as fast as possible, to a high tolerance temperature.

One specific application might be analysing applications: the heating of the stainless steel oil sample bottles and their contents.

The CYLINDER THERM heater heats through conduction and its' large contact surface with the stainless steel bottle brings the heat into the sample much faster then through convection, hot air. The conduction heating principle is simple, reliable and economical. Conduction of heat through metal is more efficient than heating by means of air and much faster.

2 Particular advantages

- Fast heat up time
- High temperature set point accuracy
- Maximum sample temperature
- T3: 230 – 248 °F
- T4: 140 – 167 °F
- Modular system which easily can be adapted according to individual needs
- The maximum temperature of the heater is managed electronically and a built in temperature sensitive fuse ensures that the maximum allowed temperature never is exceeded. This principle protected by Intertec patent is very reliable and ensures a high safety in terms of explosive protection.
- A RS 485 interface enables networking and setting parameters from a PC.
- extensive error monitoring
- Long service life of the controller, as no mechanical switching elements are used (solid state). The calculated failure probability with uninterrupted operation of 10 years is less than 5 %.
- Negligible network regeneration through phase group control with no voltage triac switching
- The set point temperature can be adjusted continuously.
- Rough Industrial design inside an cast aluminium box.

3 System description

A SMART CYLINDER THERM heating system consists of an electrical heater CYLINDER THERM HI (Picture 1 and 2) and one digital controller SMART (Picture 3). Below the two heaters:



Picture 1 (CP Cylindertherm CPA 500 T3 HI D)



Picture 2 (CP Cylindertherm CPA 500 T3 HI S)

The CYLINDER THERM is a block of aluminium. An electrical cartridge inside heats the block and the heat is conducted to the stainless steel bottle which are to be heated. Inside the CYLINDER THERM there is a temperature sensor, which reports the heaters inside temperature to the SMART controller.



Picture 3 (The SMART Temperature Controller)

The controller consists of an electronic section which is completely sealed with silicon and is accessed through a connecting terminal.



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Picture 4 (The temperature sensor holder)



Picture 5 (The whole system)

The plastic bottle illustrates the stainless steel sample bottle.

4 How to order

SMART controller with:
CP CYLINDER THERM CPA 500 T3 HI D.
CP CYLINDER THERM CPA 500 T3 HI S.
CP CYLINDER THERM CPA 500 T4 HI D.
CP CYLINDER THERM CPA 500 T4 HI S.

5 Options

Further options upon request, e.g.

- Other operating voltages
- IEC ATEX GOST Explosion protection certificate
- in a less expensive, non-explosion-proof design

6 Installation and temperature management

The physical system set up shall be made as per Picture 5. The Cylindertherm heater has M8 threads on both sides of the sample bottle cut out. Further details such as fastening of the sample bottle, or fastening the temperature sensor holder (picture 4) are left to the individual customer or can be arranged in cooperation with Intertec.

The SMART controller has two temperature sensors supporting two different controlling loops:

- temperature set point. External temperature sensor (the blue cable extending from the SMART controller)
- temperature of the heater. Temperature sensor inside the heater

Both loops operates continuously making sure that the set point is reached, whilst making sure that the heater does not overheat.

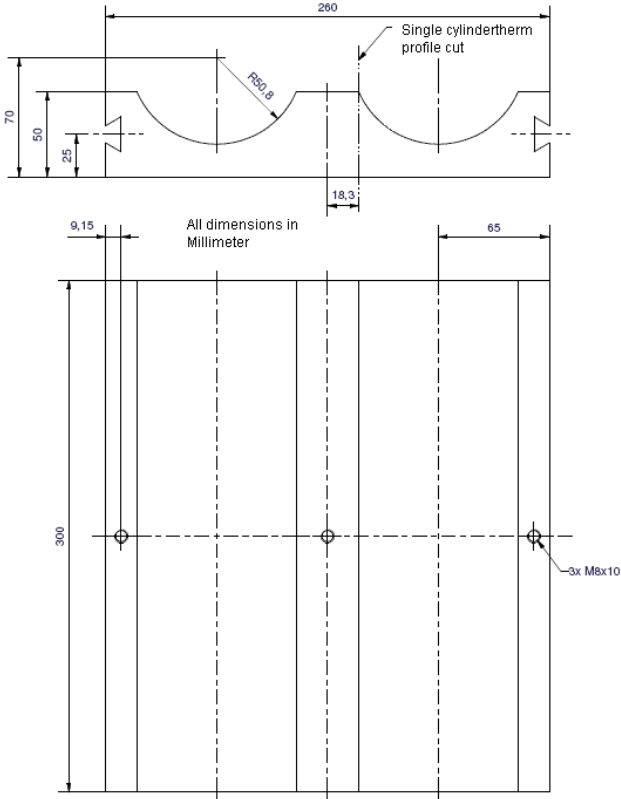
7 Technical data

7.1 CP CYLINDER THERM ...

Version	CPA 500 T3 HI S	CPA 500 T4 HI S
	CPA 500 T3 HI D	CPA 500 T4 HI D
CSA Certificate	1655545 (LR43674)	
CSA Type of Protection	Cl. 1, Div. 1, Gp ABCD T3/ T4	
Ingress Protection	IP 68	
Temperature class	T3	T4
Ambient Temperature	-58°F to + 356°F/ -50°C to 160°C	
Nominal voltage	120 VAC	
Nominal power	500 W	
Connection Cable	silicone cable, notch and oil resistant 5x1 mm ² Ø8,8 mm	
Material	sea water proof aluminium; black anodized	



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Picture 6 (The Cylindertherm heater)

7.2 SMART Controller

CSA Certificate	1655545 (LR43674)
CSA Type of Protection	Cl. 1, Div. 1, Grp ABCD T4
Ingress Protection	IP65
Nominal voltage	120 V AC
Min./ max. power	30 W to 1200 W
Rated current	10 A
Ambient Temperature	-58°F to +176°F/ -50°C to +80°C
Conduit connection	½" NPT
Height x width x depth	4.3"x5.1"x5.1"/110x130x130 mm
Material	seawater proof aluminium; coated

* see data sheet HD253

8 The SMART controllers' functionality

- PID-Controller
- Temperature management

The controller consists of an integrated triac which, when switching, is making use of phase group control with no voltage triac switching. A thermistor (NTC) is used as a temperature sensor. The electronics are completely sealed.

9 Electric wiring

